

SALMON AND STEELHEAD HABITAT LIMITING FACTORS

WATER RESOURCE INVENTORY AREA 25

**WASHINGTON STATE
CONSERVATION COMMISSION**

FINAL REPORT

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EXECUTIVE SUMMARY

Introduction

Section 10 of Engrossed Substitute House Bill 2496 (Salmon Recovery Act of 1998), directed the Washington State Conservation Commission, in consultation with local government and treaty tribes to invite private, federal, state, tribal, and local government personnel with appropriate expertise to convene as a Technical Advisory Group (TAG). The purpose of the TAG is to identify habitat limiting factors for salmonids. Limiting factors are defined as “conditions that limit the ability of habitat to fully sustain populations of salmon, including all species of the family Salmonidae.” The bill further clarifies the definition by stating “These factors are primarily fish passage barriers and degraded estuarine areas, riparian corridors, stream channels, and wetlands.” It is important to note that the responsibilities given to the Conservation Commission in ESHB 2496 do not constitute a full limiting factors analysis.

This report is based on a combination of existing watershed studies and the personal experience and knowledge of the TAG participants. WRIA 25 is located in Southwest Washington within portions of Lewis, Cowlitz, and Pacific Counties. This area encompasses numerous tributaries to the Columbia River including Coal Creek, Germany Creek, Abernathy Creek, Mill Creek, Elochoman River, Skamokawa Creek, Grays River, and Deep River (see Map 4 in Map Appendix). This report also includes tributaries to the Columbia River in WRIA 24 including the Chinook and Wallacut Rivers. Five stocks of anadromous salmon and steelhead, and coastal cutthroat trout return to the rivers. For purposes of this analysis WRIA 25 was separated into three subbasins; Mill/Germany/Abernathy, Elochoman/Skamokawa, and the Grays. Streams within WRIA 24 were included in the Grays River Subbasin.

WRIA 25 Habitat Limiting Factors

The major habitat limiting factors common to most streams within WRIA 25 included:

- **Access:** Several artificial passage barriers were identified that are either known barriers or barriers that need additional assessment. A number of the major fish passage barriers in WRIA 25 have been fixed or are slated for repair in the near future.
- **Floodplain Connectivity:** Floodplain connectivity and access to off-channel and wetland habitat within the WRIA has been affected by management practices including diking, tidegates, stream channelization, channel hardening and the historic practice of splash damming. Significant floodplain protection and restoration projects have begun within the lower Chinook and Grays Rivers.
- **Side Channel Availability:** Similar practices that have reduced floodplain connectivity have also reduced side channel habitat. A combination of limiting

factors has resulted in an overall reduction in channel complexity. Most of the streams in WRIA 25 can be characterized as having a single thread channel.

- **Bank Erosion / Stability:** Stream surveys identified several areas of active bank erosion. These areas are typically associated with alluvial soil with little or no riparian vegetation. Although data was not readily available to assess bank stability, TAG members noted that bank instability and mass wasting are significant limiting factors within many of the streams systems of WRIA 25.
- **Riparian conditions:** Riparian conditions are poor along most streams within the three subbasins. Loss of riparian function affects water quality, erosion rates, streambank stability, and instream habitat conditions.
- **Large Woody Debris:** Almost throughout WRIA 25, LWD abundance was below habitat standards. Adequate large woody debris in streams, particularly larger key pieces, is critical to developing pools, collecting spawning gravels, and providing habitat diversity and cover for salmonids.
- **Percent Pool:** Although stream surveys identified isolated areas with a “Fair” to “Good” percentage of pool habitat, in most streams pool habitat was well below habitat rating standards.
- **Water quality:** Elevated stream temperatures are the major water quality issue within WRIA 25; likely impacting juvenile salmonids and resident fisheries during summer months. With the onset of fall freshets, water temperatures appear to quickly return to levels satisfying spawning water quality criteria.
- **Water Quantity:** Both low and elevated peak flows were identified as limiting factors in most of the watersheds in WRIA 25.
- **Biological Processes:** Escapement goals are not being met for almost all stocks of salmon and steelhead returning to the rivers and streams of WRIA 25. Subsequently, the lack of nutrients may be limiting productivity.

Chinook-Grays Subbasin

Habitat Limiting Factors

Access

Several culvert sites and natural barriers were identified that require additional assessment to determine passage problems in this subbasin. Tidegates in the Chinook River impact fish passage and tidal/estuarine influence. Low flows were identified as a concern in Deep River, Seal River, the lower West Fork Grays River, and the section of the main stem Grays River between the Covered Bridge and the Canyon. Low flow concerns may be associated with the accumulation of bedload in the West Fork and main stem Grays River. TAG members also identified potential passage problems over the Grays Bay bar.

Floodplain Connectivity / Side Channel

Most of the streams within the subbasin have been divorced from their floodplains and development of side channel habitats discouraged by several management practices particularly in the lower reaches of the watersheds. Practices include flood control measures, bank hardening, and channelization to improve agriculture and splash damming. Surveys conducted by the Conservation District indicate that the available side channel habitat is limited and highly transient in nature.

Sediment / Bank Stability

The Grays River flows through areas with extremely unstable soils and geology. This natural instability, combined with extensive road construction and timber management, has lead to substantial sediment loads and unstable, aggrading stream channels. The extent of impacts to fish production from spawning substrate instability is unknown, but often considered the major limiting factor for chum and chinook salmon production the watershed.

Riparian Conditions

Riparian conditions fell below Habitat Rating Standards almost throughout the Subbasin. Exceptions included East Fork Grays, and Mitchell, Alder, Sage, and Cabin Creeks.

Channel Conditions

Stream surveys have found that the pieces of LWD/mile and the percentage of pool habitat fall well below habitat standards in most of the watersheds in this Subbasin. Channels have frequently been simplified through channelization, diking, splash damming, and the removal of LWD.

Water Quality

Elevated stream temperatures impact juvenile salmonids and resident fish, and may impact migrating fish in the early fall. Fall freshets tend to rapidly cool stream temperature to current guidelines for spawning salmonids.

Turbidity was identified as a concern in Hendrickson Creek (Deep River), “Muddy Trib” (tributary to Grays River), West Fork Grays River and South Fork Grays River. Turbidity is elevated due to mass wasting and bank instability.

Water Quantity

Both low flows and elevated peak flows were identified as limiting factors in many of the streams within the Grays River Subbasin. Bedload accumulations increase low flow problems in the mainstem Grays and West Fork Grays Rivers. High Road densities and hydrologic maturity contribute to elevated peak flows in all areas of the Subbasin.

Habitats in Need of Protection

Priority habitats in need of protection include, chum and chinook salmon spawning areas in the mainstem Grays, steelhead spawning and rearing areas in the East Fork Grays

River and Mitchell Creek, and floodplain/estuarine habitats in Grays Bay and the Chinook River. Critical spawning habitat in the Chinook River is located just above the Sea Resources Hatchery and in upper watershed tributaries.

Data Gaps

Information was lacking on habitat conditions in several tributary streams to the Grays River including Sweigler Creek, Crazy Johnson Creek, Johnson Creek and the upper reaches of the South Fork Grays River. Data was also lacking on most habitat conditions within tributaries to the Columbia in WRIA 24. Information was not available to completely address all of the limiting factors. Particular information needs include:

- Information is lacking on the quantity and quality of floodplain, side channel, estuary, or wetland habitats, and the loss of these habitats due to various land use activities.
- Stream surveys noted localized bank erosion, but data is lacking on overall bank stability.
- Little water quality information beyond stream temperature data is available within the subbasin. Only surrogate information for changes in water quantity is available within the subbasin
- Data was lacking on fish distribution by life-history stage, abundance, and productivity.
- Mass wasting was considered a significant limiting factor for chum and chinook salmon in the Grays River watershed. Data was lacking to identify specific areas of mass wasting, bank instability, and chronic erosion, to understand hydrology and sediment transport, and to identify appropriate actions to reduce sediment inputs.

Recommendations for addressing Limiting Factors

The report contains a prioritized list of limiting factors and identifies actions for both restoration and protection of salmonid habitat in the Assessment chapter.

Skamokawa-Elochoman Subbasin

Habitat Limiting Factors

Access

Several culvert sites were identified that require further assessment. Wahkiakum Conservation District is in the process of collecting information on public culverts in the subbasin. Forest industry representatives indicated that they are in the process of evaluating road and culvert condition to satisfy forest practices requirements.

Floodplain Connectivity / Side Channel Availability

Most of the streams within the subbasin have been disconnected from their floodplains and the development of side channel habitats discouraged by several management practices, particularly in the lower reaches of the watersheds. Practices include flood control measures, bank hardening, and channelization and draining to improve agriculture

and splash damming. Floodplain connectivity was considered to be in good condition within the Jim Crow Creek watershed.

Surveys conducted by the Conservation District indicate that side channel habitat is limited and highly transient in nature.

Bank Erosion / Bank Stability

Bank erosion problems were generally noted in areas with alluvial deposits and with little or no woody vegetation. Bank erosion was extensive throughout the agriculture areas in the Skamokawa Creek watershed. A combination of conditions affect stability in these areas including alluvial soils, an entrenched stream channel, lack of riparian vegetation, and upper watershed conditions that may have increased peak flows. Bank stability problems occur in the West Fork Elochoman and North Fork Elochoman due to mass wasting. The lower reaches of Germany Creek are currently responding to increased inputs of coarse sediment load from past land use activities.

Fine Sediment

Sediment fines are a significant problem in the subbasin. Numerous mass-wasting events occur in both the Elochoman and Skamokawa watersheds. The North Elochoman Watershed Analysis identified shallow rapid landslides associated with forest practices and roads as major contributors of fine sediment to the stream system.

Riparian Condition

Riparian conditions did not meet the Habitat Rating Standards almost throughout the Subbasin. Standard Creek in the Skamokawa Creek watershed was a notable exception, with a “good” rating.

Channel Conditions

Stream surveys have found that the pieces of LWD/mile and the percentage of pool habitat fall well below habitat standards in most of the watersheds in this Subbasin. Channels have frequently been simplified through channelization, diking, splash damming, and the removal of LWD. Areas in the upper watershed and tributary streams with a greater percentage of pool habitat also tend to be the areas with more LWD.

Water Quality

Elevated water temperatures likely impact rearing juveniles and resident fish, and potentially migrating fish in the early fall. Fall freshets tend to rapidly cool water temperatures to current guidelines for spawning salmonids.

Water Quantity

Low flows problems were identified in the section of the Elochoman River from the Beaver Creek hatchery upstream to the West Fork Grays River. Hydrologic immaturity and high road densities potentially increase peak flows in the most watersheds in the Subbasin. Low flows likely limit the available rearing habitat during summer months.

Priority Habitats

- Side channels in the upper segments of Wilson, Falk, and Left Fork Skamokawa Creeks provide critical habitat.
- Floodplain habitats are limited and need protection wherever they occur.
- Crippen and Standard Creeks contain some of the best and most productive habitat for steelhead in the subbasin.
- Identify and protect cooler water refuges such as Falk Creek.

Skamokawa-Elochoman Subbasin Data Gaps

Information on habitat conditions and fish passage problems was incomplete in the Subbasin. Specific data needs included:

- Water quality data is lacking for many stream systems.
- Stream surveys have not been completed for Standard and McDonald Creeks in the Skamokawa Creek watershed, and in Alger, Risk, and Birnie Creeks.
- Data was lacking on fish distribution by life-history stage, abundance, and productivity.
- Potential fish passage barriers have been identified but an assessment has not been completed to determine the extent of passage problems and the quality of upstream habitat.
- Information is lacking on the effects of tidegates and other water control structures.
- Surveys are needed to identify opportunities to restore side-channel in important spawning and rearing areas, especially in the Elochoman River.

Abernathy/Mill/Germany Subbasin

Habitat Limiting Factors

Access

Several culvert sites were identified that require further assessment to determine passage problems. Wahkiakum Conservation District is in the process of collecting information on public culverts in the subbasin. Forest industry representatives are in the process of evaluating road and culvert condition to satisfy forest practices requirements. Fish ladders on Cameron Creek (Abernathy tributary) and upstream of the Abernathy Fish Technology Center require constant maintenance. Shallow flows across bedrock may limit access to Slide Creek (Abernathy tributary). Pumping stations restrict fish access to the streams in the Longview area.

Floodplain Connectivity / Side Channel Availability

Splash damming on Mill and Abernathy Creek has disconnected the stream from its floodplain. Conditions improve in the upper watershed. Stream adjacent roads confine

the stream channel throughout this subbasin. Side channels are rare within the subbasin. Conservation District stream surveys noted that most side channels were typically short, associated with accumulation of bedload, and appear highly transient in nature.

Bank Erosion / Bank Stability

Stream surveys found limited areas with active bank erosion. However, mass wasting in the upper watersheds has deposited excessive bedload in many stream channels.

Riparian Condition

Overall riparian conditions rated “poor” in the Subbasin. Some exceptions included Weist, Erick, and Midway Creeks in the Abernathy Creek watershed.

Channel Conditions

Stream surveys found that the pieces of LWD/mile and the percentage of pool habitat fell well below habitat standards in most of the watersheds in this Subbasin. Channels have frequently been simplified through channelization, diking, splash damming, and the removal of LWD. In general, areas in the upper watershed and tributary streams with a “Fair” or “Good” percentage of pool habitat also tend to be the areas with “Fair” and “Good” LWD ratings.

Water Quality

Elevated stream temperatures likely impact rearing juveniles and resident fish, and potentially migrating fish in the early fall. Fall freshets tend to rapidly cool stream temperatures to current guidelines for spawning salmonids.

Aluminum toxicity has been identified as a concern in the Mill and Cameron Creeks. Heavy metals concentrations are elevated in Lake Sacajawea and the Longview ditches. High turbidity impacts water quality in the Longview ditches and in the Coal Creek.

Water Quantity

Hydrologic immaturity and high road densities potentially increase peak flows in the most watersheds in the Subbasin. Low flows likely limit the available rearing habitat during summer months.

Priority Habitats

- From RM 10 to RM 12 Mill Creek flows through a series of wetlands with quality side channel habitat and connected floodplains. The upper reaches of Abernathy also provide excellent rearing and spawning habitat.
- Identify and protect limited chum spawning sites in the subbasin.
- Preserve and enhance floodplain connectivity in lower Germany Creek.

Mill/Germany/Abernathy Subbasin Data Gaps

- Stream survey data has been completed on only 8 miles of stream in the Mill Creek watershed. Cowlitz Conservation District intends to complete surveys during summer of 2001.
- Germany Creek watershed has received large sediment in recent years. This sediment load is now moving downstream, reducing channel and streambed stability. Information regarding mass wasting and sediment transport is needed to identify sensitive areas, identify causal mechanisms, and assess impacts to the stream system.

The following chapters provide a detailed assessment of the habitat limiting factors within WRIA 25.